FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2000

BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603792N
PROGRAM ELEMENT TITLE: Advanced Technology Transition

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R1889 Advanced Technology Demonstration	63,043	75,217	76,333	78,908	76,399	75,924	74,650	CONT.	CONT.
R2382 Fast Patrol Boat	0	4,973	0	0	0	0	0	0	14,473
R2411 SWATH Technology Development	9,267	5,967	0	0	0	0	0	0	19,979
R2721 Vectored Thrust Ducted Propeller	0	5,868	0	0	0	0	0	0	5,868
R2722 Low Observable Multi-Function Stack	0	7,956	0	0	0	0	0	0	7,956
R2724 Advanced Hull Form In-Shore Demonstrator	0	9,945	0	0	0	0	0	0	9,945
TOTAL	72,310	109,926	76,333	78,908	76,399	75,924	74,650	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program demonstrates high-risk/high-payoff technologies

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that could significantly improve the warfighting capabilities of the fleet and joint forces, and provides the opportunity to identify and move emerging technologies quickly and efficiently from the laboratory to the fleet. Advanced Technology Demonstration (ATD) programs are selected for a match between technological potential and Navy requirements which are derived from operational issues of concern to the fleet. Risk-reducing ATDs cover integrating and assessing technology in a realistic operational environment and are focused on laying the technical foundations for acquiring improvements to future joint warfighting capabilities. Each demonstration is designed to assess the extent to which the technology is feasible, affordable, and compatible with operational concepts and projected force structure.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is budgeted within the Advanced Technology Development Budget Activity because it encompasses design, development, simulation, experimental testing and/or prototype hardware to validate technological feasibility and concept of operations, and reduce technological risk prior to initiation of a new acquisition program or transition to an ongoing acquisition program.

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(U) PROGRAM CHANGE SUMMARY FOR TOTAL PROGRAM ELEMENT (PE):

	FY 1999	FY 2000	FY 2001
(U) FY 2000 President's Budget	73,652	75,635	77,756
(U) Appropriated Value		110,535	
(U) Adjustments From President's Budget			
(U) Congressional Plus-ups		+34,900	
(U) Congressional Rescissions		-609	
(U) SBIR/STTR Transfer	-1,365		
(U) Execution Adjustments	356		
(U) Various Rate Adjustments	-334		-392
(U) Program Adjustments			-1,031
(U) FY 2001 President's Budget Submission	72,309	109,926	76,333

(U) CHANGE SUMMARY EXPLANATION:

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603792N
PROGRAM ELEMENT TITLE: Advanced Technology Transition

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R1889 Advanced Technology Demonstration	63,042	75,217	76,333	78,908	76,399	75,924	74,650	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program demonstrates high-risk/high-payoff technologies that could significantly improve the warfighting capabilities of the fleet and joint forces, and provides the opportunity to identify and move emerging technologies quickly and efficiently from the laboratory to the fleet. ATD programs are selected for a match between technological potential and Navy requirements which are derived from operational issues of concern to the fleet. Risk-reducing ATDs cover integrating and assessing technology in a realistic operational environment and are focused on laying the technical foundations for acquiring improvements to future joint warfighting capabilities. Each demonstration is designed to assess the extent to which the technology is feasible, affordable, and compatible with operational concepts and projected force structure.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 1999 ACCOMPLISHMENTS:

- (U) SMART SKINS ARRAY -- Completed ATD: conducted F/A-18 testing to demonstrate operational utility.
- (U) LOW COST MISSILE SYSTEM -- Documented completed activities of terminated ATD.

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BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603792N PROGRAM ELEMENT TITLE: Advanced Technology Transition

PROJECT NUMBER: R01889 PROJECT TITLE: Advanced Technology Demonstration

- (U) COMPETENT MUNITIONS FOR THE 5 INCH GUN -- Completed ATD: conducted flight testing demonstration.
- (U) BEST BUY -- Continued ATD: demonstrated two-piece composite projectile gun auto-loading and conducted successful two-piece rocket motor static test firing.
- (U) ADVANCED TACTICAL ACOUSTIC COMMUNICATIONS -- Completed ATD: demonstrated multi-net connectivity between submarines, ships, and unmanned undersea vehicles.
- (U) ADVANCED COMINT VOICE PROCESSING -- Completed ATD: performed system integration with EP-3 aircraft in preparation for flight demonstration of automated voice processing system.
- (U) ANTI-TORPEDO TORPEDO (ATT) TECHNOLOGY FOR SURFACE AND SUBMARINE APPLICATIONS -- Continued ATD, as coupled with NATO effort, with at-sea tests in realistic environments.
- (U) DNA VACCINES FOR COMPLEX MULTISTAGE ORGANISMS AND OTHER ORGANISMS OF MILITARY IMPORTANCE -- Continued ATD: completed safety, toxicity and immunogenicity studies for one gene vaccine in humans, and preclinical (animal) studies for five gene vaccine.
- (U) RAMICS -- Continued ATD: conducted critical tests to demonstrate lethality, validate system performance models and determine critical paramaters.
- (U) AFFORDABLE ARRAY TECHNOLOGY -- Continued ATD: conducted preliminary design reviews for acoustic modules and optoelectronic receiver.
- (U) LOW OBSERVABLE MULTI-FUNCTION STACK -- Continued ATD: exhaust gas suppressor concepts developed, RF and IR coating systems selected and antenna sub-arrays built and tested.
- (U) PLASMA-ARC PYROLYSIS OF SHIPBOARD SOLID WASTE -- Initiated ATD to demonstrate full-scale plasma-arc pyrolysis system for controlled thermal destruction of shipboard wastes. Performed preliminary design.
- (U) LONG-ENDURANCE, LOW FREQUENCY ACOUSTIC SOURCE (LELFAS)-- Initiated ATD to demonstrate a low-cost, affordable, rapidly deployable, long-endurance, low frequency acoustic source. Performed initial system design and analysis. Developed high-energy density thermal power source.
- (U) ADVANCED LINEAR MOTOR -- Initiated ATD to demonstrate an aircraft recovery system using linear motor technology. Developed preliminary concept and conducted design evaluations.

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PROJECT NUMBER: R01889 PROJECT TITLE: Advanced Technology Demonstration

- (U) REDUCED SHIPS' CREW BY VIRTUAL PRESENCE (RSVP) -- Initiated ATD to demonstrate an automated system providing environmental, machinery, structural and personnel situational awareness. Requirements have been defined, system architecture developed, feasibility demonstrations conducted for RF and sensor subsystems.
- (U) SHIPBOARD HIGHBAND MULTIFUNCTION RECEIVE SYSTEM (HBMRS) - Initiated ATD to develop and demonstrate radar, electronic warfare and communication functions in a phased array. Performed prototype design; designed, fabricated and tested sub-array transmit/receive modules.
- (U) Conducted independent reviews of on-going and planned FY00 new start ATDs.

(U) FY 2000 PLAN:

- (U) BEST BUY -- Continue ATD: conduct long-range firing demonstration of unguided projectile airframe.
- (U) ANTI-TORPEDO TORPEDO (ATT) TECHNOLOGY FOR SURFACE AND SUBMARINE APPLICATIONS -- Complete ATD with at-sea tests.
- (U) DNA VACCINES FOR COMPLEX MULTISTAGE ORGANISMS AND OTHER ORGANISMS OF MILITARY IMPORTANCE -- Complete ATD: complete clinical trials.
- (U) RAMICS -- Complete ATD: demonstrate system targeting on an operational platform.
- (U) AFFORDABLE ARRAY TECHNOLOGY -- Complete ATD: complete development of prototype array and conduct research vessel tow tests.
- (U) LOW OBSERVABLE MULTI-FUNCTION STACK -- Continue ATD: conduct land-based demonstration of antenna hardware. Install stack suppresser and shroud/antennas on test ship.
- (U) PLASMA-ARC PYROLYSIS OF SHIPBOARD SOLID WASTE -- Continue ATD: design and test feed subsystem in lab-scale reactor; demonstrate process control with various waste feed mixtures.
- (U) LONG-ENDURANCE, LOW FREQUENCY ACOUSTIC SOURCE (LELFAS)-- Continue ATD: finalize system design and initiate system fabrication.
- (U) ADVANCED LINEAR MOTOR -- Continue ATD: complete prototype design; conduct critical component testing and complete test site design.

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BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603792N PROGRAM ELEMENT TITLE: Advanced Technology Transition

PROJECT NUMBER: R01889 PROJECT TITLE: Advanced Technology Demonstration

- (U) REDUCED SHIPS' CREW BY VIRTUAL PRESENCE (RSVP) -- Continue ATD: perform lab prototype system development, integration and demonstration and conduct system development Final Acceptance Tests.
- (U) SHIPBOARD HIGHBAND MULTIFUNCTION RECEIVE SYSTEM (HBMRS) -- Continue ATD: perform software development; fabricate and test beamformer; and conduct shared aperture system integration.
- (U) REACTIVE MATERIAL ADVANCED WARHEAD -- Initiate ATD: objective is to demonstrate capability of solid reactive materials to extend mission kill in air, cruise missiles and ship self-defense arenas. Characterize materials and parameterize fragment design. Develop initial warhead concept and conduct initial vulnerability tests and analyses.
- (U) ADVANCED SHIPBOARD CRANE MOTION CONTROL SYSTEM: Initiate ATD: objective is to develop and demonstrate a crane control system that combines recent advances in nonlinear control system technologies with existing strategic Auxiliary Crane Ship electro-hydraulic cranes.
- (U) BUOYANT CABLE ANTENNA FOR HIGH DATA RATE SUB COMMS: Initiate ATD: objective is to develop and demonstrate an advanced Buoyant Cable Antenna (BCA) System to provide a submerged submarine with two-way, higher data rate Ultra High Frequency Fleet Satellite Communications and line-of-sight (LOS), L-band (Iridium) and K-band communications, as well as accessory sensor functions – Global Positioning System, Video, and Radar Early Warning.
- (U) MULTI-PLATFORM BROADBAND PROCESSING: Initiate ATD: objective is to develop and demonstrate a common, broadband integrated processing architecture for submarine, surface ship, and weapon sonar system platforms.
- (U) COMPOUND HELICOPTER CONCEPT: Initiate ATD: objective is to demonstrate reduction in fatigue loads, vibration levels and maintenance requirements through use of a ducted propeller for forward thrust with vectoring vanes at the tail, aimed at Airborne Mine Countermeasures (MCM) towing missions.
- (U) Conduct independent reviews of on-going ATD programs.

(U) FY 2001 PLAN:

- (U) BEST BUY -– Complete ATD: conduct long range guided projectile test firing.
- (U) LOW OBSERVABLE MULTI-FUNCTION STACK -- Complete ATD: conduct shipboard testing.

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PROJECT NUMBER: R01889 PROJECT TITLE: Advanced Technology Demonstration

- (U) PLASMA-ARC PYROLYSIS OF SHIPBOARD SOLID WASTE -- Complete ATD: conduct full-scale system demonstration.
- (U) LONG-ENDURANCE, LOW FREQUENCY ACOUSTIC SOURCE (LELFAS) -- Complete ATD: conclude system integration testing and fabricate two units for at sea demonstration.
- (U) REDUCED SHIPS' CREW BY VIRTUAL PRESENCE (RSVP) -- Complete ATD: install system, demonstrate at sea, and assess performance.
- (U) SHIPBOARD MULTIFUNCTION/MULTIBAND RECEIVE SHARED APERTURE -- Complete ATD: install, integrate and conduct field test demonstration.
- (U) ADVANCED LINEAR MOTOR -- Continue ATD: complete prototype development and test-site installation. Conduct full-scale prototype demonstration.
- (U) REACTIVE MATERIAL ADVANCED WARHEAD -- Continue ATD: complete explosive launch and impact analysis. Complete initial vulnerability tests and analyses. Conduct component integration tests, and fragment explosive launch and impact tests. Continue warhead system design. Initiate safety and lethality testing.
- (U) ADVANCED SHIPBOARD CRANE MOTION CONTROL SYSTEM: Continue ATD: develop control system/machine integration and ship motion stimulator. Initiate control system simulations and ship motion stimulator installation.
- (U) BUOYANT CABLE ANTENNA FOR HIGH DATA RATE SUB COMMS: Continue ATD: develop antenna, cable and supporting electronics. Develop deployment system and initiate development of demonstration system.
- (U) MULTI-PLATFORM BROADBAND PROCESSING: Continue ATD: continue development of broadband algorithms and embedded broadband processing software. Complete development of real-time processing and fiber optic communication link hardware. Initiate system integration and conduct initial multi-platform at-sea demonstrations.
- (U) COMPOUND HELICOPTER CONCEPT: Continue ATD: complete flight control system detail design, fabrication and test; complete drive system detail design, fabrication and initiate endurance testing; complete airframe structural analysis and initiate structural certification testing; and initiate flight test planning.
- (U) Conduct independent reviews of on-going ATD programs.

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BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603792N PROGRAM ELEMENT TITLE: Advanced Technology Transition PROJECT NUMBER: R01889 PROJECT TITLE: Advanced Technology Demonstration

B. (U) PROGRAM CHANGE SUMMARY: See Total Program Change Summary for PE.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.